

Performance of improved technologies on yield and economics of sesame (*Sesamum indicum*) in front line demonstration of Firozabad district in Uttar Pradesh

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ABSTRACT

In Firozabad district of Uttar Pradesh, 45 front line demonstrations were carried out to demonstrate the performance of improved technologies on yield and economics of sesame during *Kharif* 2006 and 2007. Whole package of technologies increased the seed yield by 163.68 and 153.70 per cent and net return by 209.43 and 202.51 per cent over farmer's practices during 2006 and 2007, respectively. Individual technologies also increased the yield and net return over farmer's practice during both years. Among those, highest seed yield and net returns were recorded with recommended fertilizers followed by plant protection measures. Increase in yield and returns over farmer's practice was observed higher with these technologies.

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Key words : Sesame, Rainfed, Yield, Economics, Improved technology

INTRODUCTION

Sesame in Uttar Pradesh is traditionally grown during rainy season under rainfed condition. It is grown mostly on marginal and sub-marginal lands without use of proper inputs. Thus the productivity of crop in the state is quite low (162 kg/ha) against the national average of 345 kg/ha. The results of research experiments have shown that by adopting improved technology sesame yield of 6-7q/ha may be harvested to demonstrate such technologies. All India coordinated research project on sesame and niger has organized front line demonstration on farmer's fields at different centres in the country. In the same sequence, such demonstrations were carried out in district Firozabad of Uttar Pradesh during the years *Kharif* 2006 and 2007.

MATERIALS AND METHODS

The front line demonstrations 45 in number were carried out at farmer's fields under rainfed condition during *Kharif* season. The soils were sandy loam in texture and slightly alkaline in nature having pH ranged from 7.4 to 7.8. Fertility status of soils was in general low with respect to nitrogen and phosphorus, while medium in potassium. Technologies demonstrated were whole package of practices (improved variety + fertilizers + plant protection + thinning + hand weeding), fertilizer, plant protection measures and intercropping technique.

Farmer's practice contained local variety and hand weeding. Each improved technology was demonstrated against farmer's technique in different demonstrations. The improved variety used was "Skekhar". Fertilizer were applied at recommended rate of 30 kg N + 15 Kg P₂O₅ + 15 kg K₂O/ha. Plant protection measures included seed treatment with thirum @ 2.5 g/kg seed, basal dressing of phorate – 10G in seed furrows @ 15 kg/ha and spraying of methyle-o-dimeton (25EC) @ 1 litre/ha and that of copper oxichloride @ 3kg/ha on standing crop. Sowing was done during second fortnight of July in all demonstrations. A seed rate of 4 kg/ha was sown in furrows 30 cm apart in case of sole sesame and 45 cm apart in case of intercropping with green gram. In intercropping, one row of green gram was sown in between two rows of sesame. All fertilizers were applied at sowing as band placement. In improved technology plant spacing was maintained 10 cm by thinning after 3 weeks of sowing. One hand weeding was done between 20-30 days in both improved and farmer techniques. Crop was harvested at maturity and obtained seed yield was recorded. Economics parameters of crop cultivation in different techniques were also worked out.

RESULTS AND DISCUSSION

The results of the present study as well as relevant discussion have been summarized below :

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Seed yield:

It is apparent from Table 1 that improved technologies have given much higher yield of sesame than farmer's practice in all demonstration. It might be due to better growth and development of crop plants with improved technologies. Adoption of whole improved package increased seed yield over farmer's practice by the greatest margin of 163.68 and 153.70 per cent during 2006 and 2007, respectively. It was followed by plant protection which increased yield over farmer's practice by 146.53 and 140.62 per cent during two different years. Next was the fertilizers with 139.45 and 133.01 per cent yield increase over farmer's practice. Intercropping technique showed minimum sesame equivalent yield increase of 100.94 and 97.98 per cent over farmer's practice in two years of study. One thing was remarkable that seed yield with fertilizer application was higher than with plant protection in both years, but yield increase over farmer's practice was higher with plant protection measures. It might be due to the reason that in farmer's practice, yield loss was more due to incidence of insects and diseases than without fertilizer application. Whole package produced highest seed yield, while intercropping produced lowest sesame equivalent yield during both years. It is thus proved that adoption of improved techniques either alone or in combination of all increased

sesame productivity more than 2 times. Similar results were reported by Venkatakrishnan (1998) in case of rainfed sesame crop.

Economics:

Economics of different sesame technologies was worked out in the form of gross return, cost of cultivation, net return and benefit : cost ratio. The data for all those are provided in Table 1. Gross return followed the same pattern of seed yield under different technologies but with some higher per cent of increase over farmers practice in all cases. Cost of cultivation was involved maximum in whole package (Rs. 11625 and 11175/ha) followed by plant protection (Rs. 10278 and 9690/ha) and intercropping (Rs. 8838 and 8474/ha). Fertilizers input was found minimum of Rs. 8558 and 8286/ha during 2006 and 2007, respectively. However, margin of increase in cost over farmer's practice was maximum (162.30 and 159.28%) under whole package and minimum (84.12 and 80.88%) under intercropping technique. As regards net return values, application of recommended fertilizers caused maximum increase of 270.56 and 272.16 per cent in net return over farmer's practice followed by plant protection measures which increased net return by 253.00 and 273.56 per cent. Whole improved package could increase net return over farmer's practice by 209.43 and 202.51 per

Table 1 : Impact of improved practices on productivity and economics of rainfed sesame in front line demonstrations at farmer fields of Firozabad district

Improved practices demonstrated	No. of FLDs	Mean seed yield (kg/ha)		Mean gross return (Rs./ha)		Mean cost of cultivation (Rs./ha)		Mean net return (Rs./ha)		B:C ratio	
		IT	FP	IT	FP	IT	FP	IT	FP	IT	FP
Kharif- 2006											
Whole Package	4	588 (163.68)	223 -	19992 (180.16)	7136 -	11625 (162.30)	4432 -	8367 (209.43)	2704 -	1.72 (6.83)	1.61 -
Rec. Fertilizer	3	522 (139.45)	218 -	17748 (154.42)	6976 -	8558 (90.35)	4496 -	9190 (270.56)	2480 -	2.07 (33.55)	1.55 -
Rec. P.P. Measures	4	498 (146.53)	202 -	16932 (161.94)	6464 -	10278 (124.46)	4579 -	6654 (253.00)	1885 -	1.65 (17.02)	1.41 -
Intercropping*	4	426 (100.94)	212 -	14484 (113.50)	6784 -	8838 (84.12)	4800 -	5646 (184.58)	1984 -	1.64 (16.30)	1.41 -
Kharif- 2007											
Whole Package	8	548 (153.70)	216 -	18998 (175.49)	6896 -	11175 (159.28)	4310 -	7823 (202.51)	2586 -	1.70 (6.25)	1.60 -
Rec. Fertilizer	6	480 (133.01)	206 -	16868 (152.06)	6692 -	8286 (88.92)	4386 -	8582 (272.16)	2306 -	2.03 (33.55)	1.52 -
Rec. P.P. Measures	8	462 (140.62)	192 -	15992 (160.97)	6128 -	9690 (118.19)	4441 -	6302 (273.56)	1687 -	1.65 (19.57)	1.38 -
Intercropping*	8	392 (97.98)	198 -	13586 (109.60)	6482 -	8474 (80.88)	4685 -	5112 (184.47)	1797 -	1.60 (15.94)	1.38 -

IT – Improved Technology; FP- Farmers Practice; PP – Plant Protection; Rec.- Recommended
 * Sesame Equivalent yield Note:- Figures given in parenthesis are for per cent increase over farmer practice

cent. Improved intercropping technique showed minimum increase in net return by 184.58 and 184.47 per cent over farmer's technique during the years 2006 and 2007, respectively.

In case of total net return from different techniques, it was observed that the application of recommended fertilizer earned maximum net return (Rs. 9190 and 8582/ha) followed by whole package (Rs. 8367 and 7823/ha), plant protection (Rs. 6654 and 6302/ha) and intercropping (Rs. 5646 and 5112/ha). These net return values may be attributed to seed yield and cost of practices. Whole package being highest seed yielder in all demonstrations, could not compete with fertilizer in net return because of higher cost of cultivation in the demonstrations of Firozabad. It may be supported by B:C ratio which was higher in fertilizers than whole package in all cases. It is thus proved from these results that if only single practice is to be adopted, fertilizer are most important and the next is plant protection measures. Positive effect of fertilizer on sesame has also been reported by Dwivedi and Namdavi (1992) and Thakur *et al.* (1998).

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